Padasalai's Telegram Groups!

(தலைப்பிற்கு கீழே உள்ள லிங்கை கிளிக் செய்து குழுவில் இணையவும்!)

- Padasalai's NEWS - Group
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- Lesson Plan - Group
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1.RELATIONS AND FUNCTIONS
MATHEMATICS

TIME:2.30Hrs **MARKS:100**

PART – I

I. CHOOSE THE BEST ANSWER : **14 x 1 = 14**

1.If the ordered pairs (a+2,4) and (5,2a+b) are equal than (a,b) is

a) (2,-2) b) (5,1) c) (2,3) d) (3,2)

2. The range of the relation r = $\{(x,x^2) \mid x$ is a prime number less than 13$\}$ is

a) {2,3,5,7} b) {2,3,5,7,11} c) {4,9,25,49,121} d) {1,4,9,25,49,121}

3. If {(a,8), (6,b)} represents an identify function, then the value of a and b are respectively

a) (8,6) b) (8,8) c) (6,8) d) (6,6)

4. A = {a, b, p}, B = {2, 3}, C = {p, q, r, s} then n[(A U C) x B] is

a) 8 b) 20 c) 12 d) 16

5. If n (A x B) = 6 A = {1, 3} then n(B) is

a) 1 b) 2 c) 3 d) 6

6. f (x) = $(x+1)^3 - (x-1)^3$ represents a function which is

a) Linear b) Cubic c) Reciprocal d) Quadratic

7. If g = {(1, 1), (2, 3), (3, 5), (4, 7)} is a function given by g(x) = αx+β then the value of α and β are

a) (-1, 2) b) (2, -1) c) (-1, -2) d) (1, 2)

8. Let f(x) = $\sqrt{1+x^2}$ then

a) f(xy) = f(x).f(y) b) f(xy)≥ f(x).f(y) c) f(xy) ≤ f(x).f(y) d) none of the above

9. If f : A → B is a bijective function n(B) = 5, then n(A) is equal to

a) 7 b) 5 c) 49 d) 25

10. If $f(x) = 2x^2$ and g(x) = $\frac{1}{3x}$, then f o g is

a)$3/2x^2$ b) $2/3x^2$ c) $2/9x^2$ d) $1/6x^2$

11. Let A= {1, 2, 3, 4} and B = {4, 8, 9, 10}. A function f : A→ B given by f = {(1,4), (2,8), (3,9), (4,10)} is a

a) Many – one function b) Identify function

c) One –to-one function d) Into function

12. If n (A) =p, n (B) =q, then the total number of relations that exists between A and B is

a) pq b) p^q c) 2^{pq} d) $2^{pq} - 1$

13. If f(x) = 2x -1 then find f(1.5).

a) 2 b) 1 c) 5 d) 3

14. If n (A x B) = 20 and n (A) = 5 then n(B) is _____

a) 10 b) 5 c) 2 d) 4

PART – II **10 x 2 = 20**

II. ANSWER THE FOLLOWING: (ANY 10) THEN *Q.NO: 24 IS COMPULSARY*.

16. Let A = { 1, 2, 3} and B= {x|x is prime number less than 10}. Find A x B and B x A.
17. If A x B = {(3, 2), (3, 4), (5, 2), (5, 4)} then find A and B.
18. Find A x B and B x A if A = {m, n}; B = ∅.
19. Let A = {1, 2, 3, 4, ……..45} and R be the relation defined as "is square of" on A. Write R as a subset of A x A. also, find the domin and range of R.
20. A relation 'f' is defined by $f(x) = x^2 - 2$ where, $x \in \{-2, -1, 0, 3\}$
    (i) List the elements of f (ii) Is f a function
21. Given $f(x) = 2x - x^2$, find f(x+1).
22. A plane is flying at a speed of 500km per hour. Express the distance d travelled by the plane as function of time t in hours.
23. Let A = { 1, 2, 3, 4} and B = N. Let f:A→ B be defined by $f(x) = x^3$ then, (i) find the range of f (ii) identify the type of function.
24. Check whether f o g = g o f if f(x) = x – 6, $g(x) = x^2$.
25. If $f(x) = x^2 - 1$. Find f o f o f.
26. Find the value of K, such that f o g = g o f if f(x) = 3x + 2, g(x) = 6x – k.
27. Represent the function f ={(1, 2), (2, 2), (3, 2), (4, 3), (5, 4)} through
    (i) An arrow diagram (ii) a table form (iii) a graph
28. If A = {-2, -1, 0, 1, 2} and f: A → B is an onto function defined by $f(x) = x^2+x+1$ Then find B.
29. Given the function F:x → x^2 – 5x+6, evaluate (i) f (-1) (ii) f (2a)

PART – III **10 x 5 = 50**

III.ANSWER THE FOLLOWING *ANY 10* QUESTIONS AND *38 IS COMPULSARY*:-

30. Let A = {x ∈ W |x<2}, B = {x∈ N|1<x≤4} and C= {3, 5} verify
    A x (B U C) = (A x B) U (A x C).
31. Given A = {1, 2, 3}, B = {2, 3, 5}, C = {3, 4} and D = {1, 3, 5}, check if
    (A ∩ C) x (B ∩ D) = (A x B) ∩ (C x D) is true?
32. A function f is defined by f(x) =2x -3
    (i) $\frac{f(0)+f(1)}{2}$ (ii) Find x such that f(x) = 0.
    (iii) Find x such that f(x) = x. (iv) Find x such that f(x) = f (1 – x)
33. The distance S an objecttravels under the influence of gravity in time t seconds is given by S (t) = $\frac{1}{2}$ gt^2+at+b where, (g is the acceleration due to gravity), a, b are constants. Check if the function S (t) is one – one.

34. A function f: [-5, 9] → R is defined as follows:

$$f(x) = \begin{cases} 6x + 1 \ \ if \ -5 \ \leq x < 2, \\ 5x2 - 1 \ \ if \ 2 \ \leq x < 6 \\ 3x - 4 \ \ if \ 6 \ \leq x \ \leq 9 \end{cases}$$

Find (i) f(-3) + f(2) (ii) f(7) – f(1) (iii) 2f(4) + f(8) (iv) $\frac{2f-(-2)-f(6)}{f(4)+f(-2)}$

35. The function 't' which maps temperature in Celsius (C) into temperature Fahrenheit (F) is defined by t(C) = F where F=$\frac{9}{5}$ C + 32. Find,

(i) t(0) (ii) t(28) (iii) t(-10) (iv) the value of C when t (c) =212 (v) The temperature when the Celsius value is equal to the Fehrenheit value.

36. Let f = {(-1, 3), (0, -1), (2, -9)} be a Linear eqauation from z to z. find f(x).

37. Let F: A→ B be a function defined by f(x) = $\frac{x}{2}$ -1 , where A = {2, 4, 6, 10, 12},

B = {0, 1, 2, 3, 5, 9}. Represent by

(i) Set of Ordered pairs (ii) a table (iii) Arrow diagram (iv) a graph

38. Show that (f o g) o h = f o (g o h) if f(x) = x-4, g(x) = x^2 and h(x) = 3x -5.

39. Show that (f o g) o h = f o (g o h) where f(x) = x^2, g(x) =2x, h(x) = x+4.

PART – IV

IV. ANSWER THE FOLLOWING : **2 x 8 = 16**

40. Constuct a triangle similar to a given triangle ABC with it's sides equal to $\frac{6}{5}$ of corresponding sides of the triangle ABC (Scale factor $\frac{6}{4} > 1$).

41. Draw a graph $x^2 - 4x + 4 = 0$.

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